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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/762,868

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Ljerka Ukrainczyk

SP03-007

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03/10/2006

CORNING INCORPORATED

SP-TI-3-1

CORNING, NY 14831

EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/762,868

Applicant(s)

UKRAINCZYK, LJERKA

Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed February 11, 2006 has been fully considered and entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Forkner et al. (US 5,559,911).

Regarding claim 1; Forkner et al. discloses a lensed fiber (see Figure 5), comprising:

- an optical fiber (112); and
- a lens (116) formed at the distal end of the optical fiber (112), the lens having a convex surface and a minimum diameter determined by $2 T \tan(\theta)$, where $\theta = \sin^{-1}(NA/n)$, wherein T is the thickness of the lens, n is the index of refraction, and NA is the numerical aperture;

- wherein a radius of curvature of the convex surface is not smaller than a mode field radius of a mode in the lensed fiber.

It is noted that the numerical aperture is defined as $NA = n \sin(\theta)$, which gives $\theta = \sin^{-1}(NA/n)$. And that the diameter of the lens is given by $2 T \tan(\theta)$, where T is the thickness of the lens, where $\tan(\theta)$ is given by the radius of the lens divided by the thickness of the lens, and the diameter of the lens is twice the radius of the lens.

Claims 1 and 3-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Ukrainczyk et al. (WO 02/103424 A1).

The applied reference has a common assignee and one common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1; Ukrainczyk et al. discloses a lensed fiber (see Figure 3A), comprising:

- an optical fiber (6); and
- a lens (7) formed at the distal end of the optical fiber (6), the lens having a convex surface and a minimum diameter determined by $2 T \tan(\theta)$, where $\theta = \sin^{-1}(NA/n)$, wherein T is the thickness of the lens, n is the index of refraction, and NA is the numerical aperture;

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- wherein a radius of curvature of the convex surface is not smaller than a mode field radius of a mode in the lensed fiber.

It is noted that the numerical aperture is defined as $NA = n \sin(\theta)$, which gives $\theta = \sin^{-1}(NA/n)$. And that the diameter of the lens is given by $2 T \tan(\theta)$, where T is the thickness of the lens, where $\tan(\theta)$ is given by the radius of the lens divided by the thickness of the lens, and the diameter of the lens is twice the radius of the lens.

Regarding claims 3-6; Ukrainczyk et al. discloses that a radius of curvature of the lens is in a range from approximately 50 to 5,000 micrometers; that a thickness of the lens is in a range from approximately 15 to 18,000 micrometers; that a distance to beam waist in air of the lens is in a range from approximately 0 to 100 mm; and that a mode field diameter at beam waist of the lens is in a range of approximately 3 to 1,000 micrometers (see Table 1 on page 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (US 4,815,807).

Regarding claim 1; Kaneko et al. discloses a lensed fiber (see Figure 4), comprising:

- an optical fiber (42); and
- a lens (41) formed at the distal end of the optical fiber (42), the lens having a minimum diameter determined by $2 T \tan(\theta)$, where $\theta = \sin^{-1}(NA/n)$, wherein T is the thickness of the lens, n is the index of refraction, and NA is the numerical aperture. (see column 3, lines 1-20);
- wherein the radius of curvature of the lens is not smaller than a mode field radius of the lensed fiber.

For comparison, the radius (R) in line 20 of column 3 is given as $R \geq L \tan \theta_c$, and θ_c in line 12 of column 3 is given as $\theta_c = \sin^{-1}(NA/n)$, wherein R is the radius and the diameter is twice the radius, L is the thickness, NA is the numerical aperture and n is the index of refraction. Therefore, $2R=D$, wherein D=diameter, and $D \geq 2 L \tan \theta_c$, wherein $\theta_c = \sin^{-1}(NA/n)$.

Kaneko et al. does not disclose that the lens has a convex surface or that a radius of curvature of the convex surface is not smaller than a mode field radius of a mode in the lensed fiber. However, Kaneko et al. does disclose that the lens (41) is a collimating lens.

Plano-convex collimating lenses are well known and readily available in the art. One of ordinary skill in the art would have found it obvious to use a plano-convex lens as the collimating lens in the invention of Kaneko et al., since plano-convex lenses are known collimating lenses that are readily available in the art and it appears that the invention would collimate the light equally as well.

Regarding claims 3-5; Kaneko et al. discloses that a radius of curvature of the lens is in a range from approximately 50 to 5,000 micrometers; that a thickness of the lens is in a range from approximately 15 to 18, 000 micrometers; and that a distance to beam waist in air of the lens is in a range from approximately 0 to 100 mm (see Table 1).

Regarding claim 6; Kaneko et al. discloses all of the limitations of claim 6 as applied above, except for specifically stating that a mode field diameter at beam waist of the lens is in a range from approximately 3 to 1000 micrometers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the mode field diameter at beam waist of the lens be in a range from approximately 3 to 1000 micrometers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233) and that discovering the optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ (CCPA 1980)).

Response to Arguments

Applicant's arguments with respect to claims 1 and 3-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.


Michelle R. Connelly-Cushwa
Patent Examiner
March 2, 2006